

REMARKS

Claims 1-11 currently appear in this application. The Office Action of March 7, 2002, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicants respectfully request favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Rejections under 35 U.S.C. 112

Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

This rejection is respectfully traversed. Submitted herewith is a copy of the periodic table found in *The Merck Index, Twelfth Edition*, in which group 15 is also referred to as group Va. The specification and claims have been amended to changes 15 to 5a in conformance with IUPAC usage. Moreover, X has been defined as fluorine or an element of group 5a of the periodic table.

It is not understood why claims 5, 7, 8, 10, and 11 are considered to be indefinite. Claim 1 is directed to cyanine dyes. Claim 5 has been amended to

recite a composition for light absorption comprising as active ingredient a cyanine dye of claims 1-4. Claim 6 is now the composition of claim 5 which is sensitive to a laser beam with a wavelength of around 780 nm when in a thin layer form. Claim 7 is a composition for optical recording medium comprising as active ingredient a cyanine dye of claims 1-4. Claim 8 is the composition of claim 7 with a light resistant improver. Claims 10 and 11 are directed to processes for preparing cyanine dyes according to claims 1-4. It is believed that these cosmetic amendments to the claims place them into conformance with the requirements of 35 U.S.C. 112. These amendments to the claims are merely to place them into better U.S. form, and are not intended to introduce any limitations into the claims.

With respect to claims 10 and 11, it is not necessary that one of the anions would have to be that of the resultant dye, because the specification at page 8, lines 7-21, it is clear that both X_1^- and X_2^- can be exchanged with the desired counter ions according to conventional methods after completion of the reaction. The counter ions are exemplified at page 8, lines 7-17.

Claim Objections

Claim 3 is objected to as being of improper dependent form for failing to further limit the subject

matter of a previous claim. The Examiner alleges that all pentamethine dyes absorb at this wavelength.

Claim 3 has been amended to make it clear that it is in a thin layer form, and that in that thin layer form the cyanine dye of claim 1 or 2 substantially absorbs visible light at a wavelength of around 780 nm.

Art Rejections

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. '839. Sato et al. is said to teach the use of compounds of formula I wherein the benzene nuclei may be condensed with one or more benzene rings or substituted with various moieties.

This rejection is respectfully traversed. First, all of the compounds disclosed in Sato et al., including compounds 5, 7, and 10, have 7 carbons in the methyne chain when the terminal moieties at both ends are benzoindole moieties. In contrast thereto, compounds 6 and 10 of Sato et al. have 5 carbons in the methyne chain. There is thus no motivation to replace the terminal moieties of compounds 6 and 16 with benzoindole moieties with the reasonable expectation as the Examiner indicates.

As the Federal Circuit stated in *In re Lee*, 61 USPQ2d 1430 (January 18, 2002, Fed. Cir.), "As applied to the determination of patentability *vel non*, when the

issue is obviousness, 'it is fundamental that rejections under 35 U.S.C. 103 must be based on evidence comprehended by the language of that section.' *In re Grasselli*, 53 USPQ2d 1769, 1774 (Fed. Cir. 2000)... When patentability turns on the question of obviousness, the search for an analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. See, e.g., *McGinley v. Franklin Sports, Inc.*, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) ('the central question is whether there is a reason to combine [the] references,' a question of fact drawing on the *Graham* factors.)

'The factual inquiry whether to combine references must be thorough and searching.' *Id.* This precedent has been reinforced in myriad decisions, and cannot be dispensed with, See, e.g., *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000). ('A showing of a suggestion, teaching, or motivation to combine the prior art references is an "essential component of an obviousness holding"'') (quoting *C. R. Bard, Inc. v. M3 Systems, Inc.* 48 USPQ2d (Fed. Cir. 1998)) The Court went on to quote *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999), "Our case law makes clear that the best defense against the

subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."

There is a requirement for specificity in combining references, or in combining disclosures of different types of compounds in one reference, *See, In re Kotzab*, 55 USPQ2d 13134, 1317 (Fed. Cir. 2002) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.").

In the present case, the Examiner has shown no motivation to substitute the terminal moieties of compounds 6 and 16 with benzoindole moieties to obtain compounds having the same properties as those claimed herein.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Inagaki et al. or Maeda et al. or Morishima et al. in view of Sato.

This rejection is respectfully traversed. First, the compounds disclosed in Inagaki are different from those of the present invention in that R₁ and R₂ are the same in the Inagaki compounds, while the present invention requires that R₁ and R₂ be different from each

other. Table 2 on page 30 of the present specification makes it clear that compounds in which R_1 and R_2 are the same have inferior solubility in organic solvents as compared with compounds when R_1 and R_2 are different. Thus, there is no motivation to provide compounds in which R_1 and R_2 are the same, as these compounds would be inferior to compounds in which R_1 and R_2 differ from each other.

Maeda does not disclose or suggest the presently claimed cyanine dye at all. The closest compound disclosed by Maeda is in Example 8, in which R^1 and R^2 are different, but in this case the anion is CeO_4 , which is not an anion that is useful in the dyes of the present invention.

Morishima also does not disclose a cyanine dye as claimed herein. While compound B-28 at column 29 of Morishima appears to be the closest compound, the anion differs from the anions of the cyanine dyes of the present invention.

There is no motivation to combine Inagaki or Maeda or Morishima with Sato because the compounds disclosed in each publication are believed to be the preferred compounds. There is nothing in any of these patents that would lead one skilled in the art to expect that the solubility of a cyanine dye in organic solvent

would be improved, while the desirable optical properties are maintained, when the cyanine dye has a formula as claimed in claim 1.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashiro et al. in view of Inagaki et al. and/or Sato et al.

This rejection is respectfully traversed. Yashiro teaches noting about the use of an anion as recited in claim 1 of the present invention. While the Examiner states that Saito teaches that the use of PF_6^- anion as the counter ion in some organic dyes to increase the thermal decomposition temperature of the cyanine dye, the cyanine dye used in the "Nineteenth Embodiment" of Saito et al., i.e., the cyanine dyes for which the thermal decomposition temperature was tested, have a completely different methyne chain compared with those in Yashiro. For example, in the "Nineteenth Embodiment" in Saito the methyne chain is defined as T, as shown in Figure 6. Thus, a skilled artisan would have obtained no reasonable suggestion from Saito with respect to the relationship between the thermal decomposition temperature and the anion in the compounds of Yashiro. There is nothing in Saito et al. that would make it obvious to modify the Yashiro teaching using the PF_6^- anion as taught by Saito et al.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. further in view of either Borrer et al., Mee et al., Lee et al., GB355693, and Hamer, "The Cyanine Dyes and Related Compounds."

This rejection is respectfully traversed. As discussed above, all of the compounds disclosed in Sato et al. have 7 carbon atoms in the methyne chain when the terminal moieties at both ends are benzoindole moieties. Compounds 6 and 16 of Sato have 5 carbon atoms in the methyne chain. There is no reason one skilled in the art would replace the terminal moieties of compounds 6 and 16 with benzoindole moieties to obtain the compounds claimed herein.

None of the other references cited leads one skilled in the art to compounds as claimed herein. None of the references disclosing methods of making cyanine dyes or related compounds specifically leads one skilled in the art to making the particular compounds claimed herein. Just because one could use old and well known synthesis processes to form the cyanine dyes of Sato et al., there is nothing in any of the cited references that would lead one skilled in the art to obtain the compounds as claimed in the present application.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Inagaki et al. or Maeda

et al. or Morishima et al. as modified by Sato et al. and further in view of either Borrer et al., Mee et al., Lee et al., VB 355693 and Hamer.

This rejection is respectfully traversed. There is nothing in any of the cited patents that would lead one skilled in the art to prepare the particular cyanine dyes of the present invention, even using conventional techniques.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashiro et al. as modified by Inagaki et al. and/or Saito et al. further in view of either Borrer et al., Mee et al., Lee et al., GB355693 and Hamer.

As discussed above, there is no motivation in any of the cited art to make the compounds of the present invention. None of the cited references, either alone or in combination, would lead one skilled in the art to the particular cyanine dyes of the present invention, which dyes are characterized by their asymmetry, the length of the methyne chain, and the particular anion associated therewith. Without some motivation to prepare these compounds, there can be no finding of obviousness of the method of preparation.

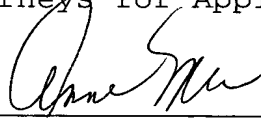
It is noted that the prior art made of record and not relied upon is merely considered to be pertinent to applicant's disclosure.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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"Version with markings to show changes made"

IN THE SPECIFICATION

Please amend the first paragraph on page 5,
lines 8-13 as follows:

In Formula 1, R_1 denotes methyl or ethyl group,
and R_2 differs from R_1 and denotes a straight- or
branched-chain alkyl group. R_3 denotes hydrogen or a
substituent selected from halogens and lower alkyl
groups. X^- denotes an anion having fluorine or a
~~metall~~ican element of ~~the 15~~ group 5a in the periodic law
table.

Page 5, please amend the last paragraph line 26
through page 6 line 5 as follows:

X^- is not specifically restricted to as long as
it is an anion having fluorine or a ~~metall~~ican element of
~~the 15~~ group 5a in the periodic law table, and depending
on uses, it can be appropriately selected with an index
of their light absorbing property and solubility in
organic solvents. ~~When using~~For use in optical recording
media, preferable ones are, for example, hexafluoro
phosphoric acid ion and hexafluoro antimononic acid ion
which contain fluorine or antimony and which do not
substantially deteriorate reflection layers containing
metals.

Please amend the paragraph on page 15, line 26
through page 17 line 3 as follows:

The cyanine dyes of the present invention exert a totally-no-problematic solubility in various organic solvents on actual uses, and this does not substantially restrict organic solvents used for coating the cyanine dyes on substrates. Thus, in the preparation of optical recording media according to the present invention, for example, TFP frequently used to prepare optical recording media or the following organic solvents other than TFP can be selectively and appropriately used in combination, if necessary: Hydrocarbons such as hexane, cyclohexane, methylcyclohexane, dimethylcyclohexane, ethylcyclohexane, isopropylcyclohexane, *tert*-butylcyclohexane, octane, cyclooctane, benzene, toluene, and xylene; halogen compounds such as carbon tetrachloride, chloroform, 1,2-dichloroethane, 1,2-dibromoethane, trichloroethylene, tetrachloroethylene, chlorobenzene, bromobenzene, and α -dichlorobenzene; alcohols and phenols such as methanol, ethanol, 2,2,2-trifluoroethanol, 1-propanol, 2-propanol, 1-methoxy-2-propanol, 1-ethoxy-2-propanol, 1-butanol, 1-methoxy-2-butanol, 3-methoxy-1-butanol, 4-methoxy-1-butanol, isobutyl alcohol, pentyl alcohol, isopentyl alcohol, cyclohexanol, 2-methoxyethanol (methyl cellosolve), 2-ethoxy ethanol (ethyl cellosolve), 2-

isopropoxy-1-ethanol, diethylene glycol, triethylene glycol, propylene glycol, glycerine, phenol, benzyl alcohol, cresol, and diacetone alcohol; ethers such as diethyl ether, diisopropyl ether, tetrahydrofuran, tetrahydropyran, 1,4-dioxane, anisole, 1,2-dimethoxyethane, diethylene glycol dimethyl ether, dicyclohexyl-18-crown-6, methyl carbitol, and ethylcarbitol; ketones such as furfural, acetone, 1,3-diacetyl acetone, ethyl methyl ketone, and cyclohexanone; ~~esters~~ esters such as ethyl acetate, butyl acetate, ethylene carbonate, propylene carbonate, and trimethyl phosphate; amides such as formamide, N-methyl formamide, N,N-dimethylformamide, and hexamethylphosphoric triamide; nitro compounds such as nitromethane and nitrobenzene; nitriles such as acetonitrile, and propionitrile; amines such as ethylenediamine, pyridine, piperidine, morpholine, and N-methylpyrrolidone; and sulfur-containing compounds such as dimethylsulfoxide and sulfolane.

Please amend the second paragraph on page 17, line 18 through page 18 line 15 as follows:

The substrates used in the present invention can be commercially available ones, and usually they are prepared by forming appropriate materials, for example,

prepared by forming appropriate materials, for example, into discs, 12 cm in diameter and 0.6-1.2 mm in thickness, to ~~suited~~ suit to final uses by the methods such as compression molding, injection molding, compression-injection molding, photopolymerization method (2P method), thermosetting integral method, and lightsetting integral method. Such discs can be used singularly or plurally after appropriately attaching them together with adhesives or adhesive sheets, etc. In principal, any materials for substrates can be used in the present invention as long as they are substantially transparent and have a transmittance of at least 80%, and preferably at least 90% in the range of wavelength of 400 nm to 850 nm. Examples of such materials are glasses, ceramics, and others including plastics such as poly(methyl methacrylate), polycarbonate, polystyrene (styrene copolymer), ~~polymethylpentene~~ polymethylpentene, polyetherimide, polysulfone, polyethersulfone, polyarylate, polycarbonate/polystyrene alloy, polyester carbonate, polyphthalate carbonate, polycarbonate acrylate, non-crystalline polyolefin, methacrylate copolymer, diallyl carbonate diethylene-glycol, and epoxy resin; among which polycarbonate is frequently used. In the case of plastic substrates, concaves for expression of synchronizing signals and

addresses of tracks and sectors are usually transferred to the internal circle of the tracks during their formation. The concaves are not specifically restricted to a specific form, and preferably they are formed to give 0.3-1.2 μm in average wide and 70-200 nm in width.

Please amend the paragraph on page 20, line 11 through page 22 line 15 as follows:

Since the optical recording media of the present invention can record information of characters, images, voices, and other digital data at a relatively-high density, they are extremely useful as recording media for professional and family use to record/keep these recorded information. Particular examples of the kinds of industries and the forms of information to which the optical recording media of the present invention can be applied are as follows: Drawings of ~~constructions~~construction and engineering works, maps, ledgers of ~~loads~~roads and rivers, aperture cards, architectural sketches, documents of disaster protection, wiring diagrams, arrangement plans, ~~informations~~information of ~~news-papers~~newspapers and magazines, local information, construction reports, blueprints of productions, etc., which are all for ~~constructions~~construction and ~~architectures~~architecture;

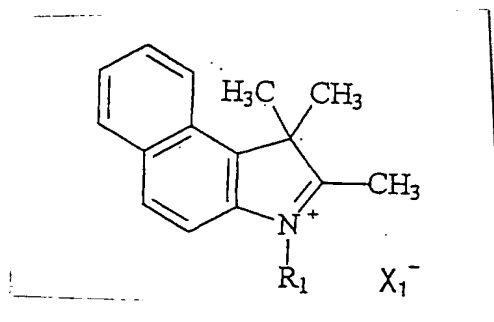
ingredient tables, prescriptions, product specifications, product price tables, ~~part~~sparts lists, maintenance information, case study files of accidents and troubles, manuals for claims, production schemes, technical documents, sketches, details, ~~company's~~companies house-made product files, technical reports, analysis reports, etc., which are all for manufacturing; customers' information on sales, customers' information, information ~~of on~~ companies, contracts, ~~informations of news papers~~information on newspapers and magazines, business reports, reports of ~~companys~~companies credibility, stock lists, etc., which are all for sales; ~~companys~~companies information, stock price records, statistical documents, ~~informations of news papers~~information on newspapers and magazines, contracts, costumers' lists, documents of application/notification/licenses/authorization, business reports, etc., which are all for financial; information of real property and transportations, sketches of ~~constructions~~construction, maps, and local ~~informations of news papers~~information on newspapers and magazines, lease contracts, companies' information, stock lists, traffic information, customers' lists, etc., which are all for real property and transportation; diagrams of writings and piping arrangements, documents of disaster protection, tables of operation manuals, documents of

investigations, technical reports, etc., which are all for electric and gas supplies; medical ~~cartes~~charts, files of clinical histories and case studies, diagrams for medical care/institution relationships, etc., which are all for medical services; texts, collections of questions, educational documents, statistical information, etc., which are all for private and preparatory schools; scientific papers, records, records in academic societies, monthly/reports of ~~researches~~research, data ~~of~~ ~~researches~~research, records and indexes of documents and ~~literatures~~literature, etc., which are all for universities, colleges, and research institutes; inspection data, literatures, patent publications, weather maps, analytical records of data, customers' files, judicial precedents on laws, etc., which are all for the field of information; membership lists, history notes, records of works/products, competition data, data of meetings/congresses, etc., which are all for organizations/associations; sightseeing information and traffic information, etc., which are all for sightseeing; indexes of homemade publications, ~~information of news papers~~information on newspapers and magazines, who's who files, sport records, telop files, scripts for broadcastings, etc., which are all for mass communications and publishers; and others such as maps,

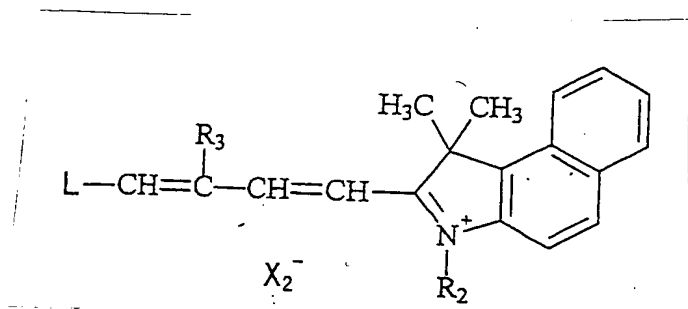
where in Formulae 2 and 3, X_1^- and X_2^- denote appropriate counter ions, and L denotes an appropriate leaving group.

11. (Amended) The process for producing ~~any one of thea~~ cyanine ~~dyesdye~~ of claims 1 to 4, which comprises a step of reacting a compound represented by Formula 4, having R_1 as defined in Formula 1, with a compound represented by Formula 5 having R_2 and R_3 as defined in Formula 1:

Formula 4:



Formula 5:



ledgers of roads and ~~livers~~rivers, fingerprint files, resident cards, documents of application/notification/license/authorization, statistical documents, public documents, etc, which are all for government offices. Particularly, the write-once type optical recording media of the present invention can be advantageously used for storing records of cartes and official documents which must not be deleted or intentionally rewritten, and used as electric libraries of art galleries, libraries, museums, broadcasting stations, etc.

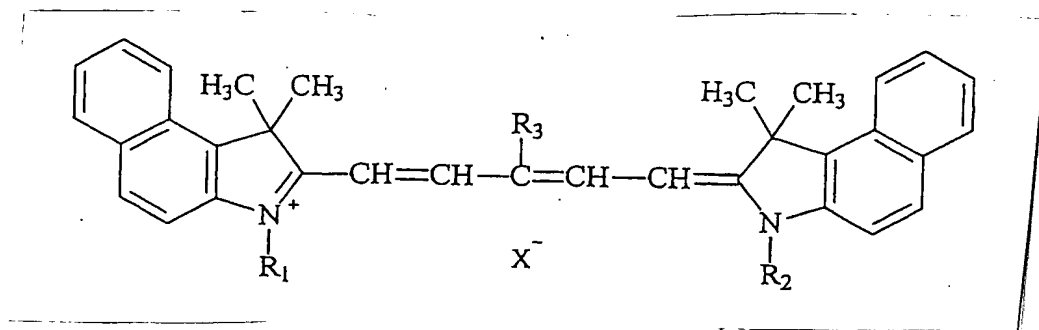
IN THE CLAIMS

Please amend claim 1 as follows:

1. (Amended) A cyanine dye represented by

Formula 1:

Formula 1:



where in Formula 1, R₁ denotes a methyl or ethyl group; R₂ differs from R₁ and denotes a straight- or branched-chain alkyl group; R₃ is hydrogen atom or a substituent selected from the group consisting of halogens and lower-alkyl groups; X⁻ denotes an anion excluding BF₄, containing fluorine or a-metallican element of ~~the 15~~ group 5a in the periodic ~~law~~ table.

3. (Amended) The cyanine dye of claim 1 or 2, which substantially absorbs a visible light at a wavelength of around 780 nm when in a thin layer form.

5. (Amended) A composition for light ~~absorbent~~absorption comprising ~~any one of the~~ active ingredient, a cyanine ~~dyes~~dye of claims 1 to 4.

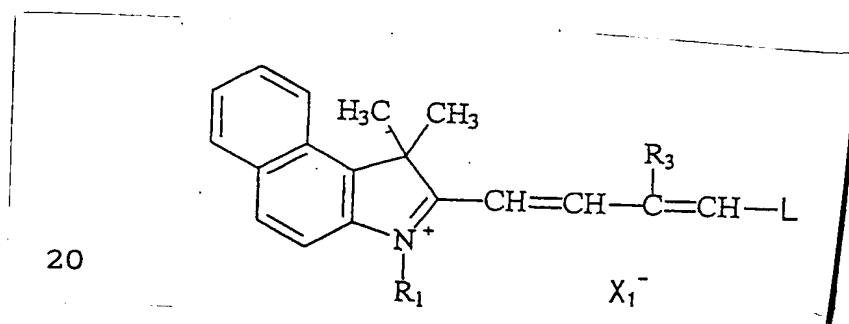
6. (Amended) The ~~light-absorbent~~composition of claim 5, which is sensitive to a laser beam with a wavelength of around 780 nm when in a thin layer form.

7. (Amended) ~~An~~ A composition for optical recording medium comprising ~~any one of the cyanine dyes~~ of as active ingredient a cyanine dye of claims 1 to 4.

8. (Amended) The optical recording medium of claim 7, which ~~comprises any one of the cyanine dyes of claim 1 to 4 and~~includes an appropriate light resistant improver.

10. (Amended) A process for producing ~~any one of the~~a cyanine ~~dyes~~dye pf claims 1 to 4, which comprises a step of reacting a compound represented by Formula 2, having R_1 and R_3 as defined in Formula 1, with a compound represented by Formula 3 having R_2 as defined in Formula 1:

Formula 2:



Formula 3:

